REMARKS/ARGUMENTS

Claims 1 and 10 have been amended to include the limitations of Claim 5, which has been canceled without prejudice.

Claim 5 has been canceled without prejudice. Claims 12-20 have been previously withdrawn and Claims 1, 3-4, and 6-10 remain pending in the present application. No claims and no new matter have been added, and no additional claim fee due. Entry of this Amendment is respectively requested.

OFFICIAL

OBJECTIONS

1) Specification

The Amendment filed on June 23, 2003 has been objected to under 35 U.S.C. §132, specifically the material added to the specification at page 9, line 25 to page 11 line 19 was not supported in the original disclosure and consequently introduces new matter into the specification. Applicants respectively traverse the objection.

The objected passage in question may be found at Column 16 line 40 to Column 17 line 4 and Column 17 lines 21 to 67 of US Patent No. 5,965,235 which was specifically incorporated by reference at page 7 line 19 to 22, of the originally filed application. Consequently, there is no introduction of new matter as the text in question was already in the specification.

Copies of these sections of US Patent No. 5,965,235, with the relevant portions highlighted, have been included with this response.

In view of the foregoing remarks, it is respectfully requested that the objections to the figures be reconsidered and withdrawn.

REJECTIONS

Rejections Under 35 U.S.C. §102

Lecomte

Claims 1, 3 and 8 have been rejected under 35 U.S.C. §102(e) as being anticipated by Lecomte US Patent No 6,065,272. It is the Examiner's contention that that the claimed articles are anticipated by the disclosure of Lecomte. Applicants respectively traverse the rejection.

Applicants have amended Claim 1 to include the limitations of canceled Claim 5, which was never rejected under 35 U.S.C. §102(e) as being anticipated by Lecomte. Consequently, this amendment has rendered the rejection moot and Applicant respectfully request withdrawal of this rejection.

In view of the foregoing remarks and the clarifying amendments, it is respectfully requested that rejection of Claim 1, 3 and 8 be reconsidered and withdrawn.

Rejection under 35 U.S.C. 103

1) Lecomte

Claims 9 and 10 are rejected under 35 U.S.C. §103 as being obvious over Lecomte, US Patent No 6,065,272. The Office Action asserts that both the handle and an oval opening portion are obvious since "it would be an obvious matter of design choice to add a handle....and to make the outlet opening and a portion of the passage way in an oval shape". Applicants respectfully traverse this assertion.

The Office Action has failed to establish a prima face case of obviousness. The Office Action has failed to provide an analysis of the cited art with regard to the various factors for determining obviousness as outlined in Graham v. John Deer Co., 383 U.S. 1, 148 USPQ 459 (1966). See also MPEP 2141. For example, the conclusory statement in the rejection that "it would be an obvious matter of design choice to add a handle....and to make the outlet opening and a portion of the passage way in an oval shape" provides no analysis of why one of ordinary skill would have modified Lecomte. The analysis of these factors is required by law to establish a prima face case of obviousness, and since no analysis is present, no prima face case of obviousness has been made. See MPEP 2142.

Furthermore, Applicants have amended Claim 1, upon which Claims 9 and 10 depend, to include the limitations of canceled Claim 5, which was never rejected under 35 U.S.C. §103 as being unpatentable over Lecomte. Consequently, this amendment has rendered the rejection moot and Applicant respectfully request withdrawal of this rejection.

Consequently, in view of the foregoing remarks and amendments, it is respectfully requested that the rejection of Claims 9, and 10 be reconsidered and withdrawn.

2) Lecomte in view of Hamilton

Claims 5-7 are rejected under 35 U.S.C. §103 as being obvious over Lecomte, US Patent No. 6,065,272 in view of Hamilton et al., US Patent No. 5,662,758. It is asserted in the Office Action that the claimed device is obvious in light of what is taught by Lecomte in view of Hamilton. Applicants respectively traverse the rejection.

The Office Action has failed to establish a prima face case of obviousness. The Office Action has failed to provide an analysis of the cited art with regard to the various factors for determining obviousness as outlined in Graham v. John Deer Co., 383 U.S. 1, 148 USPQ 459 (1966). See also MPEP 2141. For example, the conclusory statement in the rejection that "it would have been obvious to modify Lecomte apparatus by applying the flexible film with adhesive as taught by Hamilton" provides no analysis of why one of ordinary skill would have modified Lecomte, let alone why one of ordinary skill would have selected Hamilton to combine it with Lecomte instead of another patent. The analysis of these factors is required by law to establish a prima face case of obviousness, and since no analysis is present, no prima face case of obviousness has been made. See MPEP 2142.

Furthermore, it is well known that to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In re Rouffet 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir.1998). Second, there must be a reasonable expectation of success. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. See MPEP 2143.01; In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); and In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992). Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. MPEP706.02(j); In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); and MPEP Section 2143 - Section 2143.03.

Turning to the present rejection, one of ordinary skill would have no motivation to combine Lecomte with Hamilton.

In Lecomte the invention is directed to the permanent heat-sealing of various types of waste in a heat-sealable plastic sleeve. See Lecomte Column 2, lines 10-13, Column 3, lines 23-25, 32-35, 43, 54-57, and 63-67 and Column 4, lines 10-11,

29-33, 39 and 44, Claim 1 and Figures 1 and 2. Contrast this with Hamilton which is specifically directed to a flexible film having a protected pressure sensitive adhesive thereon. See Hamilton, abstract Figures and Claims. The purpose of the protected pressure sensitive adhesive of Hamilton is for a product which is "releasably sealing to a target surface", Column 1, line 8, and "for releasable sealing of the composite material to such surfaces or even to itself", Column 3, lines 24-25 (Emphasis added). The adhesive is protected to prevent premature sealing by the adhesive on the film, especially to itself. And when the protrusions are collapsed the adhesive is available to form a seal with the desired surface.

However, this asserted advantage is of little relevance as the Office Action has failed to is provide any suggestion, motivation or teaching as to why one of ordinary skill would even bother to include an adhesive with a film, let alone the specific film of Hamilton, and use it in the apparatus of Lecomte.

The apparatus of Lecomte "welds", a heat-sealable plastic sleeve to form a receptacle for receiving waste. Column 1, line 55-57 and Figure 1. Once the waste is placed in to this formed "receptacle" the heat-sealable plastic sleeve is then welded at the other end to form a closure. See Lecomte Column 3, lines 23-25, and Column 4, lines 10-11, 29-33, 29 and 44, Claim 1 and Figures 1 and 2. There is no need for an adhesive on the heat-sealable plastic sleeve, as the seal is formed by the "retractable heating pliers", Column 3, line 24 Figure 1 and Claim 1.

The Office Action has missed that one of ordinary skill in the art would realize that the benefits of Hamilton alleged in the Office Action are simply irrelevant. Hamilton allegedly solves problems associated with films containing adhesives, i.e., preventing the adhesive from inadvertent adherence to other surfaces. Since the "retractable heating pliers" are sealing the heat-sealable plastic sleeve there is no reason, motivation, suggestion, teaching or need for that matter, to include an adhesive which would need to be "protected from inadvertent adherence to other surfaces". Hamilton is teaching one of ordinary skill away from any combination with Lecomte. Why include an adhesive, let alone the protected one of Hamilton, when not using an adhesive, such as Lecomte already does, avoids the entire issue of "inadvertent adherence to other surfaces" identified in the Office Action as a problem to be solved by one of ordinary skill. One of ordinary skill would not

consider Hamilton relevant let alone worthy of consideration for combination with Lecomte.

Furthermore, it is well settled that the question of obviousness under 35 U.S.C. §103 is not what the artisan could have done, but rather what would have been obvious for such a person to do. See Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986), and In re Brouwer, 37 U.S.P.Q.2d 1663 (Fed. Cir. 1996). See also MPEP 2143.01; In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). It is unclear as to why one of ordinary skill would consider the combination of Lecomte and Hamilton relevant. Furthermore, there is no teaching, motivation and/or suggestion to one of ordinary skill modify any possible combination of Lecomte and Hamilton and the only suggestion provided in the Office Action has been impermissible hindsight based on Applicants' own teaching.

Consequently, in view of the foregoing remarks and the clarifying amendments, it is respectfully requested that the rejection of Claims 5-7 be reconsidered and withdrawn.

3) Couper in view of Shiotari

Claims 1, 3 and 8-10 are rejected under 35 U.S.C. §103 as being obvious over Couper, US Patent No. 3,536,192 in view of Shiotari, US Patent No. 5,890,351. It is asserted in the Office Action that the claimed device is obvious in light of what is taught by Couper in view of Shiotari. Applicants respectively traverse the rejection.

The Office Action has failed to establish a prima face case of obviousness. The Office Action has failed to provide an analysis of the cited art with regard to the various factors for determining obviousness as outlined in Graham v. John Deer Co., 383 U.S. 1, 148 USPQ 459 (1966). See also MPEP 2141. For example, the conclusory statement in the rejection that "it would have been obvious to modify Couper's apparatus by incorporating the cutting means as taught by Shiotari" provides no analysis of why one of ordinary skill would have modified Couper, let alone why one of ordinary skill would have selected Shiotari to combine it with Couper instead of any other patent. The analysis of these factors is required by law

to establish a prima face case of obviousness, and since no analysis is present, no prima face case of obviousness has been made. See MPEP 2142.

Furthermore, Applicants have amended Claim 1, upon which Claims 3 and 8 depend, and Claim 10 to include the limitations of canceled Claim 5, which was never rejected under 35 U.S.C. §103 as being unpatentable over Couper in view of Shiotari. Consequently, this amendment has rendered the rejection moot and Applicant respectfully request withdrawal of this rejection.

Consequently, in view of the foregoing remarks and amendments, it is respectfully requested that the rejection of Claims 1, 3, and 8-10 be reconsidered and withdrawn.

4) Couper in view of Shiotari and Hamilton

Claims 5-7 are rejected under 35 U.S.C. §103 as being obvious over Couper, US Patent No. 3,536,192 in view of Shiotari, US Patent No. 5,890,351 and further in view of Hamilton et al., US Patent No. 5,662,758. It is asserted in the Office Action that the claimed device is obvious in light of what is taught by Couper in view of Shiotari and Hamilton. Applicants respectively traverse the rejection.

The Office Action has failed to establish a prima face case of obviousness. The Office Action has failed to provide an analysis of the cited art with regard to the various factors for determining obviousness as outlined in Graham v. John Deer Co., 383 U.S. 1, 148 USPQ 459 (1966). See also MPEP 2141. For example, the conclusory statement in the rejection that "it would have been obvious to modify Couper apparatus by applying the flexible film with adhesive as taught by Hamilton" provides no analysis of why one of ordinary skill would have modified Couper, let alone why one of ordinary skill would have selected Shiotari and Hamilton to combine with Couper instead of any other patents. The analysis of these factors is required by law to establish a prima face case of obviousness, and since no analysis is present, no prima face case of obviousness has been made. See MPEP 2142.

Furthermore, it is well known that to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine

reference teachings. In re Rouffet 149 F.3d 1350, 47 USPQ.2d 1453 (Fed. Cir.1998). Second, there must be a reasonable expectation of success. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. See MPEP 2143.01; In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990); and In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992). Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. MPEP706.02(j); In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); and MPEP Section 2143 - Section 2143.03.

Turning to the present rejection, one of ordinary skill would have no motivation to combine Couper with Shiotari, let alone the combination of Couper and Shiotari with Hamilton.

In Couper the "stock of tubular material" is tied at one sealing the tubular material at one end. See Figure 1. Waste is placed in the sealed tubular material, additional lengths of which are drawn through the annular container as needed. See Columns 1, line 16-25. The annular container may be disposed of when the sealed tubular material is full or the sealed tubular material may be removed and disposed of. See Column 2, lines 3-4, and 35-36. There is nothing in Couper which teaches or suggest to one of ordinary skill to include a cutting device, let alone the device of Shiotari. On the contrary, Couper teaches away from use of any device, let alone a cutting device, which would be used to divide or separate the sealed tubular material into portions. The fact that the device as a whole can be disposable teaches one of ordinary skill towards retention of a single article for disposal and away from separating the sealed tubular material in to multiple articles which would each individually need to be disposed of.

The Office Action has failed to provide any motivation in Couper as to why one of ordinary skill would want to combine it with a cutting device, let alone the one illustrated in Shiotari.

Additionally, the Office Action has also failed to show any reason why one of ordinary skill would consider Hamilton relevant, let alone provide any reason, motivation or teaching for one of ordinary skill in Couper as to the desirability of a flexible film which comprises an adhesive, let alone in combination with a cutting device, such as the device illustrated in Shiotari.

from whom?

Furthermore, it is well settled that the question of obviousness under 35 U.S.C. §103 is not what the artisan could have done, but rather what would have been obvious for such a person to do. See Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986), and In re Brouwer, 37 U.S.P.Q.2d 1663 (Fed. Cir. 1996). See also MPEP 2143.01; In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). It is unclear as to why one of ordinary skill would consider the combination of Couper and Shiotari with Hamilton relevant. Furthermore, there is no teaching, motivation and/or suggestion to one of ordinary skill modify any possible combination of Couper and Shiotari with Hamilton and the only suggestion provided in the Office Action has been impermissible hindsight based on Applicants' own teaching.

Consequently, in view of the foregoing remarks and the clarifying amendments, it is respectfully requested that the rejection of Claims 5-7 be reconsidered and withdrawn.

Obviousness-Type Double Patenting

Claims 1, 3, and 5-10 have been provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over Claims 1-3, 5-8, 11 14, 15 and 18 of copending U.S. Patent Application No. 10/010,391. Applicant respectively traverses the rejection.

The Office Action has failed to establish a prima facc case of obviousness. The only information provided on the cited art is simple statement that the conflicting claims are "not patentably distinct from each other because it would have been obvious to omit the specific elements from the copending Application claims" and provides is no analysis of the cited art with regard to the various factors for determining obviousness as outlined in Graham v. John Deer Co., 383 U.S. 1, 148

USPQ 459 (1966). See also MPEP 2141. The analysis of these factors is required by law to establish a prima face case of obviousness, and since no analysis is present, no prima facc case of obviousness has been made. See MPEP 2142.

In view of the foregoing remarks, it is respectfully requested that rejection of Claims 1, 3, and 5-10 be reconsidered and withdrawn.

Conclusion.

In light of the amendments and remarks presented herein, Applicants respectively submit that Claims 1, 3, and 5-10 are allowable over the prior art of record or any combination thereof. In the event that issue remain prior to allowance of the noted claims, then the Examiner is invited to call Applicant's undersigned agent to discuss any remaining issues.

OFFICIAL

Respectfully submitted,

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3 displays a wider range of % polygon area and does not converge to a constant % polygon area until a box area of at least about 8 square inches is reached. Further, for consistency in physical properties throughout the web more constrained tessellations exhibit less variation in aerial density, i.e., the localized number of protrusions and corresponding protrusions wells, per unit area.

Based upon the data presented in FIGS. 6 and 7, it would be apparent that a predictable level of consistency may be designed into the patterns generated according to the preferred method of the present invention even though amorphousness within the pattern is preserved. Accordingly, three-dimensional, amorphous-patterned, nesting-resistant materials may be formed with statistically-predictable geometric and physical material properties.

Referring once again to the drawings, and more particularly to FIG. 5, there is shown a plan view of a representative three-dimensional, nesting-resistant sheet material of the present invention, which is generally indicated as **10**. FIG. 5 represents an amorphous two-dimensional pattern generated by the above-described method utilizing a constraint factor of 0.75. Material **10** has a plurality of non-uniformly shaped and sized, preferably hollow, protrusions **12**, surrounded by spaces or valleys **14** therebetween, which are preferably interconnected to form a continuous network of spaces within the amorphous pattern. FIG. **5** also shows a dimension A, which represents the width of spaces **14**, measured as the substantially perpendicular distance between adjacent, substantially parallel walls at the base of the protrusions. In a preferred embodiment, the width of spaces **14** is preferably substantially constant throughout the pattern of protrusions.

Protrusions **12** of the present invention are generated with non-uniform size and shape so that material **10** may be wound onto a roll without nesting occurring between layers of material within the roll. The nesting-resistant feature is achieved because the amorphous pattern of the protrusions, as discussed above, limits the ability of the face of one layer to align with the back of another layer whereby the protrusions of one layer enter the depressions formed behind each protrusion in an adjacent layer. The benefit of narrow constant-width spaces between protrusions is that protrusions **12** cannot also enter spaces **14** when layers of material **10** are placed face to face.

Protrusions **14** are preferably spaced center to center an average distance of approximately two protrusion base diameters or closer, in order to minimize the volume of valleys between protrusions and hence the amount of substance located between them. For applications where it is intended that the protrusions be deformable, the protrusions **14** preferably have heights which are less than their diameters, so that when they deform, they deform by substantially inverting and/or crushing along an axis which is substantially perpendicular to a plane of the material. This protrusion shape and mode of deforming discourages protrusions **14** from folding over in a direction parallel to a plane of the material so that the protrusions cannot block a substance (if present) in the valley between them from contact with a target surface.

Returning briefly to the photomicrograph of FIG. **1**, representative protrusion **12** is shown in a representative as-formed condition, while representative protrusion **13** is shown in a deformed condition wherein the upper central portion of the protrusion has been pushed downwardly such that the protrusion has collapsed by substantially inverting upon itself Such deformation thereby reduces the height of the protrusion without extending outwardly over the adjoining valley or space between protrusions.

FIGS. **8** and **9** depict fragmentary elevational cross-sections of material **10** taken at a location where a complete protrusion **12** and both adjoining spaces or valleys **14** can be seen in cross-section. FIG. **8** depicts the three-dimensional structure of FIG. **5** by itself, with no adhesive or other substance added to the basic sheet material. In this view, the upper surface of the web which faces the viewer of FIG. **5**, and which includes the projecting portions of the protrusions **12**, is identified with the numeral **15**, and is referred to hereafter as the male side of the material. Correspondingly, the lower surface of the web facing away from the viewer of FIG. **5**, which includes the openings of the hollow portions of the protrusions **12**, is identified with the numeral **17**, and is referred to hereafter as the female side of the material.

FIG. **9** shows the structure of FIG. **5**, analogously to FIG. **8**, but with a substance **16** added to spaces **14**, as well as to the hollow underside of the protrusions **12**, in accordance with the teachings of commonly-assigned, co-pending concurrently-filed U.S. patent application Ser. No. 08/744,850 now U.S. Pat. No. 5,871,607, Attorney's Docket No. Case 5922R, filed Nov. 8, 1996, in the names of Peter W. Hamilton and Kenneth S. McGuire, entitled "Material Having A Substance Protected By Deformable Standoffs and Method of Making", the disclosure of which is hereby incorporated herein by reference. Substance **16** partially fills the spaces **14** so that an outer surface of protrusions **12** remain external to the surface level of substance **16** such that the protrusions prevent the substance **16** on the male side of the material from making contact with external surfaces. With regard to the male side of the material, substance **16** partially fills the hollow protrusions such that the reverse side of the valleys or spaces between respective protrusions serves an analogous function in preventing substance **16** within the protrusions from making contact with external surfaces. Substances within different sides of the material **10** and/or within different geometrically-distinct zones within a side of material **10** need not be the same substance and could in fact be distinctly different substances serving distinctly different functions.

"Substance" is defined in this invention as any material capable of being held in open valleys and/or depressions of a three dimensional structure. In the present invention, the term "substance" can mean a flowable substance which is substantially non-flowing prior to delivery to a target surface. "Substance" can also mean a material which doesn't flow at all, such as a fibrous or other interlocking material. "Substance" may mean a fluid or a solid. Adhesives, electrostatics, mechanical interlocking, capillary attraction, surface adsorption, and friction, for example, may be used to hold the substances in the valleys and/or depressions. The substances may be permanently held in the valleys and/or depressions, or the substances may be intended to be released therefrom when exposed to contact with external surfaces or when the three dimensional structure is deformed, heated, or otherwise activated. Of current interest in the present invention include substances such as gels, pastes, foams, powders, agglomerated particles, prills, microencapsulated liquids, waxes, suspensions, liquids, and combinations thereof.

The spaces in the three-dimensional structure of the present invention are normally open; therefore it is desirable to have substances stay in place and not run out of the structure without an activation step. The activation step of the present invention is preferably deformation of the three-dimensional structure by compression. However, an activation step to cause substance to flow could be heating the material to above room temperature or cooling it below

room temperature. Or it could include providing forces excessive of the earth's gravity. It could also include other deforming forces, such as tensile forces and combinations of these activation phenomena.

The term "deformable material" is intended to include foils, polymer sheets, cloth, wovens or nonwovens, paper, cellulose fiber sheets, co-extrusions, laminates, and combinations thereof. The properties of a selected deformable material can include, though are not restricted to, combinations or degrees of being: porous, non-porous, microporous, gas or liquid permeable, non-permeable, hydrophilic, hydrophobic, hydroscopic, oleophilic, oleophobic, high critical surface tension, low critical surface tension, surface pre-textured, elastically yieldable, plastically yieldable, electrically conductive, and electrically non-conductive. Exemplary materials include wood, metal, rigid polymer stock, ceramic, glass, cured resin, thermoset materials, cross-linked materials, rubber, frozen liquids, concrete, cement, stone, man-made materials, etc. Such materials can be homogeneous or composition combinations.

In a particularly preferred embodiment, protrusions 14 have an average base diameter of about 0.015 inches (0.038 cm) to about 0.030 inches (0.076 cm), and more preferably about 0.025 inches (0.064 cm). They also have an average center-to-center spacing of from 0.03 inches (0.08 cm) to 0.06 inches (0.15 cm), and more preferably about 0.05 inches (0.13 cm) spacing. This results in a high number density of protrusions. The more protrusions per unit area, the thinner the piece of material and protrusion walls can be in order to resist a given deformation force. In a preferred embodiment the number of protrusions per square inch exceeds 200 and the protrusions occupy from about 30% to about 70% of the protrusion side of the piece of material. They have a protrusion height of about 0.004 inches (0.010 cm) to 0.012 inches (0.030 cm), and more preferably about 0.006 inches (0.015 cm) height. The preferred material is 0.0003 inch (0.0076 mm) nominal thickness high density polyethylene (HDPE).

For fabrication of an adhesive-containing, three-dimensional, nesting-resistant sheet material, a preferred layer of substance 16 is preferably a latex pressure sensitive adhesive about 0.001 inch (0.025 mm) thick. Even more preferably, layer of substance 16 may be about 0.0005 inch (0.013 mm) thick layer to about 0.002 inch (0.051 mm) thick layer of hot melt adhesive, specification no. Fuller HL-2115X, made by H. B. Fuller Co. of Vadnais Heights, Minn. Any adhesive can be used which suits the needs of the material application. Adhesives may be refastenable, releasable, permanent, or otherwise. The size and spacing of protrusions is preferably selected to provide a continuous adhesive path surrounding protrusions so that air-tight seals may be made with a target surface.

Film materials may be made from homogeneous resins or blends thereof Single or multiple layers within the film structure are contemplated, whether co-extruded, extrusion-coated, laminated or combined by other known means. The key attribute of the film material is that it be formable to produce protrusions and valleys. Useful resins include polyethylene, polypropylene, PET, PVC, PVDC, latex structures, nylon, etc. Polyolefins are generally preferred due to their lower cost and ease of forming. Preferred material gauges are about 0.0001 inches (0.0025 mm) to about 0.010 inches (0.25 mm). More preferred gauges are from about 0.0002 inches (0.005 mm) to about 0.002 inches (0.051 mm). Even more preferred gauges are from about 0.0003 inches (0.0076 mm) to about 0.001 inches (0.025 mm).

Providing a film modulus of elasticity sufficiently high to minimize film stretch during use is beneficial to sealing material 10 to a target surface. Stretched film results in residual forces parallel to the plane of adhesive contact, which may cause a weak adhesive bond to break. The larger and more closely spaced the protrusions, the greater the likelihood of stretch occurring in a given film. Although elasticity in material 10 is believed to be undesirable for use as a container wrap which seals to a container, there are potentially many other uses for an elastic material containing a pattern of substance. Reducing the protrusion spacing to the closest possible spacing which is manufacturable may increase material stretch, but it may be beneficial in reducing the volume of substance between protrusions. Different applications for the formed material of the present invention will dictate ideal size and density of protrusions, as well as the selection of the substances used therewith.

The material property "beam strength" of the three-dimensional sheet material was mentioned above in terms of the beam strength preventing significant nesting of any region of material surrounding a given protrusion even in the event that that protrusion finds itself superimposed over a single matching or larger depression of compatible shape since the protrusions surrounding the single protrusion of interest will differ in size, shape, and spacing from those surrounding the other protrusion/depression. Beam strength is thus an important factor to consider when selecting the material type and thickness, as well as the density and pattern of protrusions. It has been observed that in general larger numbers of smaller protrusions provide a greater level of beam strength for a given material type and thickness than a smaller number of larger protrusions. Said differently, thinner and more conformable materials may be utilized and still realize the non-nesting advantages of the present invention through the use of an amorphous pattern having generally comparatively small, comparatively high number density protrusions.

It is believed that the protrusion size, shape and spacing, the web material properties such as flexural modulus, material stiffness, material thickness, hardness, deflection temperature as well as the forming process determine the strength of the protrusion. The forming process is important in polymer films for example, since "cold forming" or embossing generates residual stresses and different wall thickness distributions than that produced by thermoforming at elevated temperatures. For some applications it is desirable to provide a stiffness (deformation resistance) which is sufficient to withstand a pressure of at least 0.1 pounds per square inch (0.69 kPa) without substantially deforming protrusions to where the substance contacts an external surface. An example of this requirement would be the need to wind the web onto a roll for transport and/or dispensing. Even with very low in-wound pressures of 0.1 pounds per square inch (0.69 kPa), a residual in-wound pressure in the interior of the roll may deform protrusions in the web sufficiently to bring the overlaying web layers into contact with the substance. A "threshold" protrusion stiffness is required to prevent this winding damage from occurring. Similarly, when the web is stored or dispensed as discrete sheets, this "threshold" stiffness is required to prevent premature activation of the product due to the weight of overlaying layers of sheets or other forces, such as forces induced by shipping vibrations, mishandling, dropping and the like.

If the three dimensional structure of the present invention is used as a tape or a storage wrap, for example, the external contact surfaces may be either compliant or rigid and planar